ALCATEL-LUCENT OMNISWITCH 6860
STACKABLE LAN SWITCHES

The Alcatel-Lucent OmniSwitch™ 6860 Stackable LAN Switches (SLS) are compact, high-density Gigabit Ethernet (GigE) and 10 GigE platforms designed for the most demanding converged networks.

In addition to high performance and availability, the OmniSwitch 6860 offers enhanced quality of service (QoS), user authentication, deep packet inspection (DPI) and comprehensive security features to secure the network edge while accommodating user and device mobility with a high degree of integration between the wired and wireless LAN. The enhanced models of the OmniSwitch 6860 family also supports emerging services such as application fingerprinting for network analytics and up to 60 watts of Power over Ethernet (PoE) per port, making it ready to meet the evolving business needs of enterprise networks.

These versatile LAN switches can be positioned:
- At the edge of mid- to large-sized converged enterprise networks
- At the aggregation layer
- In a small enterprise network core
- In the data center for GigE server connectivity and SDN applications

OS6860-P24 **OS6860E-U28** **OS6860E-48**

FEATURES	BENEFITS
• Versatile features and models offering high-density Gigabit and 10 Gigabit interfaces • Up to eight switches can be connected using Virtual Chassis technology to create a single chassis-like entity with up to 32 10 Gigabit uplinks and 384 Gigabit ports	• With the variety of interfaces and models, the OmniSwitch 6860 family meets any customer configuration need and offers excellent investment protection and flexibility. • The OmniSwitch 6860 Virtual Chassis increases system redundancy, resiliency and high availability while simplifying deployment, operations and management of the network.
• IEEE 802.3af and 802.3at compliant PoE of 30 W per port on all ports • The enhanced models of the OmniSwitch 6860 family support up to 60 W of PoE per port on four ports	With its advanced PoE capabilities and high density of PoE ports, the OmniSwitch 6860 is ideal for converged campus deployments by offering deployment flexibility, simplifying the wiring and reducing the time to deploy edge devices such as VoIP phones, surveillance cameras, 802.11ac access points and emerging devices that require higher than 30 W, such as video displays or even a small network switch or a thin virtual desktop infrastructure (VDI) client.
• Hardware-accelerated DPI available on all models • Application monitoring and fingerprinting are available on the enhanced models	• DPI technology allows for real-time classification of flows at the application level, monitoring and QoS treatment to assign higher priority and more bandwidth to business-critical applications. • By enabling the application monitoring functionality on the OmniSwitch 6860, network administrators can obtain a comprehensive view of up to 1000 applications running in the network. This type of visibility can be used to optimize the performance of the network as well as apply adequate control.

Alcatel·Lucent
Enterprise

FEATURES	BENEFITS
Advanced Unified Access features for converged campus network solutions in application fluent network • Integrated Policy with dynamic User Network Profiles • Extensive security features for network access control (NAC), policy enforcement and attack containment • SIP Fluency to provision and monitor QoS treatment of SIP flows • Airgroup™ Network Services for Bonjour speaking devices	• Unified access and application fluent networks provide simplified network architecture with automated controls and enhanced security for both wired and wireless users. Offers enhanced management and security for reduced operational complexity costs. • User network profiles add intelligence to the network to automatically adapt as users move around the corporation without compromising the security. • With its advanced capabilities, the OmniSwitch 6860 shows outstanding performance when supporting real-time voice, data and video applications. • Improved user experience with the integration of services that enable employees to access the same applications and service, and have consistent experience across wired and wireless.
Enables deployment of comprehensive and secure BYOD services in enterprise networks*: • Advanced guest management capabilities • Device on-boarding and automated IEEE 802.1x provisioning • Device posture/health check and fingerprinting • Application management	• The OmniSwitch 6860 offers flexible deployment options and enables the network for BYOD deployments and zero-touch guest management. • Supports dynamic change of authentication (CoA) and enforces traffic remediation or restriction for non-compliant devices. • Provides control and increased security over corporate data/applications for the mixed personal and corporate environment for improved visibility and control for IT.
The OmniSwitch 6860 is SDN ready. • Supporting programmable AOS RESTful APIs, OpenFlow and OpenStack allow the creation of specialized services.	• Opens the door for fast deployment of new network services that meet employees' needs to continuously adopt new applications that support the business. • The support of SDN reassures customers that their investment is ready for the future and enables interoperability with third-party solutions.

* requires Aruba ClearPass

ALCATEL-LUCENT OMNISWITCH 6860 MODELS

The OmniSwitch 6860 family offers customers an extensive selection of Gigabit fixed-configuration switches with up to 60 watts of PoE per port and power supply options that accommodate the most demanding requirements. The models are in a 1RU form factor and are 19-inch rack-mountable. They all have four built-in 10 Gigabit SFP+ ports that support 10 Gigabits and 1000-X, two 20 Gigabit QSFP+ ports used as Virtual Chassis connections, USB ports and console ports.

There are four basic models in the OmniSwitch 6860 family and five enhanced models. All of the OmniSwitch 6860 PoE models support PoE+, up to 30 watts of PoE on all ports; however only the enhanced models in the family support up to 60 watts of PoE on the first four ports. The enhanced models also have an Ethernet management port (EMP) port and a built-in co-processor that can be used for running Enhanced network services such as application fingerprinting and others in the future.

	GIGABIT PORTS	1G/10G SFP+ PORTS	20G QSFP+ VIRTUAL CHASSIS PORTS	DESCRIPTION
BASIC MODELS				
OS6860-24	24	4	2	Fixed-configuration chassis in a 1U form factor with 24 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports
OS6860-P24	24 PoE	4	2	Fixed-configuration chassis in a 1U form factor with 24 10/100/1000 Base-T PoE ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports
OS6860-48	48	4	2	Fixed-configuration chassis in a 1U form factor with 48 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports
OS6860-P48	48 PoE	4	2	Fixed-configuration chassis in a 1U form factor with 48 10/100/1000 Base-T PoE ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports
ENHANCED MODELS				
OS6860E-24	24	4	2	Fixed-configuration chassis in a 1U form factor with 24 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports and two 20G virtual Chassis link ports. Includes a built-in co-processor for Enhanced network services
OS6860E-P24	24 PoE	4	2	Fixed-configuration chassis in a 1U form factor with 24 10/100/1000 Base-T PoE ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports. Includes a built-in co-processor for Enhanced network services

	GIGABIT PORTS	1G/10G SFP+ PORTS	20G QSFP+ VIRTUAL CHASSIS PORTS	DESCRIPTION
BASIC MODELS (CONT'D)				
OS6860E-48	48	4	2	Fixed-configuration chassis in a 1U form factor with 48 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports. Includes a built-in co-processor for Enhanced network services
OS6860E-P48	48 PoE	4	2	Fixed-configuration chassis in a 1U form factor with 48 10/100/1000 Base-T PoE ports, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports. Includes a built-in co-processor for Enhanced network services
OS6860E-U28	28 SFP	4	2	Fixed-configuration chassis in a 1U form factor with 28 ports supporting 1000Base-X and 100Base-FX, four fixed SFP+ (1G/10G) ports and two 20G Virtual Chassis link ports. Includes a built-in co-processor for Enhanced network services

TECHNICAL SPECIFICATIONS
OMNISWITCH 6860 BASIC MODELS

PRODUCT MATRIX	OS6860-24	OS6860-48	OS6860-P24	OS6860-P48
Gigabit port count	24	48	24 (PoE)	48 (PoE)
1G/10G SFP+	4	4	4	4
20G QSFP+ VFL ports	2	2	2	2
USB port	1	1	1	1
Out-of-band EMP port	0	0	0	0
RS-232 port	1	1	1	1
Console port	1	1	1	1
Primary slide-in PSU slot	1	1	1	1
Backup slide-in PSU slot	1	1	1	1
Fans	0	0	1	1
File system flash	2 GB	2 GB	2 GB	2 GB
RAM	2 GB	2 GB	2 GB	2 GB
Max raw fabric capacity	224 Gb/s	264 Gb/s	224 Gb/s	264 Gb/s
Throughput (at 64-byte packet)	154.9 Mpps	190.6 Mpps	154.9 Mpps	190.6 Mpps
Power consumption (idle)**	35.6 W	41.7 W	61.9 W	70.8 W
Power consumption (full load)**	45.6 W	57.2 W	477 W	900 W
Heat dissipation**	121.5 BTU/h	142.3 BTU/h	211.2 BTU/h	241.6 BTU/h
MTBF with one AC power supply	408,614 h	385,181 h	133,391 h	127,594 h
Acoustic noise (dB) at 25C	45.8	45.8	42	43.5
Height	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)
Width	44 cm (17.33 in)	44 cm (17.33 in)	44 cm (17.33 in)	44 cm (17.33 in)
Depth	35 cm (13.78 in)	35 cm (13.78 in)	35 cm (13.78 in)	35 cm (13.78 in)
Weight (chassis and fan)	4.45 kg (9.8 lb)	4.67 kg (10.3 lb)	4.58 kg (10.1 lb)	4.90 kg (10.8 lb)
Weight (fully populated)***	5.17 kg (11.4 lb)	5.40 kg (11.9 lb)	6.03 kg (13.3 lb)	6.35 kg (14.0 lb)
Altitude	13,000 ft	13,000 ft	13,000 ft	13,000 ft
Operating temperature	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)
Storage temperature	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)
Humidity (operating)	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing

PRODUCT MATRIX	OS6860-24	OS6860-48	OS6860-P24	OS6860-P48
Humidity (storage)	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing
Power supplies	OS6860-BP OS6860-BP-D	OS6860-BP OS6860-BP-D	OS6860-BPPH	OS6860-BPPX
IEEE 802.3at PoE ports	0	0	24	48
60 W of PoE ports	0	0	0	0
Air flow	Front to back	Front to back	Front to back	Front to back

** Power consumption measured at the 120 V AC outlet. The full L2 traffic load measurement for the 24- and 48-port PoE models was done with the 600-W and 920-W PSU respectively. Heat dissipation: 1 watt ≈ 3.41214 BTU/h
*** Fully populated chassis includes two power supplies, mounting brackets and no transceivers

OMNISWITCH 6860 ENHANCED MODELS

PRODUCT MATRIX	OS6860E-24	OS6860E-48	OS6860E-P24	OS6860E-P48	OS6860E-U28
Gigabit port count	24	48	24 (PoE)	48 (PoE)	28
1G/10G SFP+	4	4	4	4	4
20G QSFP+ VFL ports	2	2	2	2	2
USB port	1	1	1	1	1
Out-of-band EMP port	1	1	1	1	1
RS-232 port	1	1	1	1	1
Console port	1	1	1	1	1
Primary slide-in PSU slot	1	1	1	1	1
Backup slide-in PSU slot	1	1	1	1	1
Fans	0	0	1	1	0
File system flash	2 GB	2 GB	2 GB	2 GB	2 GB
RAM	2 GB	2 GB	2 GB	2 GB	2 GB
Max raw fabric capacity	224 Gb/s	264 Gb/s	224 Gb/s	264 Gb/s	224 Gb/s
Throughput (at 64-byte packet)	154.9 Mpps	190.6 Mpps	154.9 Mpps	190.6 Mpps	160.9 Mpps
Power consumption (idle)**	38.9 W	44.1 W	65.0 W	72.9 W	70.1 W
Power consumption (full load)**	48.0 W	60.0 W	480 W	904 W	72.2 W
Heat dissipation (idle)**	132.7 BTU/h	150.5 BTU/h	221.8 BTU/h	248.7 BTU/h	239.2 BTU/h
MTBF with AC power supply	353,806 h	336,101 h	126,601 h	121,442 h	292,509 h
Acoustic noise (dB) at 25C	45.8	45.8	42	43.5	42.4
Height	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)
Width	44 cm (17.33 in)	44 cm (17.33 in)	44 cm (17.33 in)	44 cm (17.33 in)	44 cm (17.33 in)
Depth	35 cm (13.78 in)	35 cm (13.78 in)	35 cm (13.78 in)	35 cm (13.78 in)	35 cm (13.78 in)
Weight (chassis and fan)	4.58 kg (10.1 lb)	4.81 kg (10.6 lb)	4.81 kg (10.6 lb)	5.03 kg (11.1 lb)	4.58 kg (10.1 lb)
Weight (fully populated)***	5.26 kg (11.6 lb)	5.49 kg (12.1 lb)	6.26 kg (13.8 lb)	6.49 kg (14.3 lb)	5.26 kg (11.6 lb)
Altitude	13,000 ft	13,000 ft	13,000 ft	13,000 ft	13,000 ft
Operating temperature	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)	0°C to 45°C (32°F to 113°F)

PRODUCT MATRIX	OS6860E-24	OS6860E-48	OS6860E-P24	OS6860E-P48	OS6860E-U28
Storage temperature	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)
Humidity (operating)	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing
Humidity (storage)	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing	5% to 95% non-condensing
Power supplies	OS6860-BP OS6860-BP-D	OS6860-BP OS6860-BP-D	OS6860-BPPH	OS6860-BPPX	OS6860-BP OS6860-BP-D
IEEE 802.3at PoE ports	-	-	24	48	-
60 W of PoE ports	-	-	4	4	-
Air flow	Front to back	Front to back	Front to back	Front to back	Front to back

** Power consumption measured at the 120 V AC outlet. The full L2 traffic load measurement for the 24- and 48-port PoE models was done with the 600 W and 920 W PSU respectively. Heat dissipation: 1 watt ≈ 3.41214 BTU/h
*** Fully populated chassis includes two power supplies, mounting brackets and no transceivers

The OmniSwitch 6860 models are capable of supporting MacSec, Audio-Video-Bridging (AVB), and IEEE 1588 Precision Time Protocol transparent clock. The software to support these features is a future availability.

POWER SUPPLIES

All OmniSwitch 6860 models support 1+1 redundant, hot-swappable power supplies. The primary and backup power supply units are internal but removable to allow for easier maintenance and replacement. The OmniSwitch 6860 family also supports power load-sharing for PoE between the primary and backup power supplies to provide up to 1500 watts of PoE per switch. There is no interruption of service when a new power supply is installed or an existing one replaced.

PS MODELS	OS6860-BP	OS6860-BP-D	OS6860-BPPH	OS6860-BPPX
Description	Modular AC power supply. Provides 160 W system power to one OS6860 non-PoE switch	Modular DC power supply. Provides 160 W system power to one OS6860 non-PoE switch	Modular 600-W AC PoE power supply. Provides system and PoE power to one 24-port PoE switch	Modular 920-W AC PoE power supply. Provides system and PoE power to one 48-port PoE switch
Dimensions (H x W x L)	3.9 cm x 5.05 cm x 18.5 cm (1.54 in x 1.99 in x7.28 in)	3.9 cm x 5.05 cm x 18.5 cm (1.54 in x 1.99 in x7.28 in)	4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in)	4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in)
Weight	.7 kg (1.11 lb)	.88 kg (1.94 lb)	1.04 kg (2 lb)	1.05 kg(2.32 lb)
Max with 1 PSU	N/A	N/A	450 W of PoE	750 W of PoE
Max with 2 PSUs	N/A	N/A	900 W of PoE	1500 W of PoE
Input voltage/current	90 V to 136 V AC /3 A 180 V to 264 VAC /1.5 A	-36 V to-72 V DC/1.8 A to 6 A	90 V to 136 V AC /8.5 A 180 V to 264 V AC/4.25 A	90 V to 136 V AC/13 A 180 V to 264 V AC/6.5 A
Max output power/ current	150 W/12.5 A	150 W/12.5 A	600 W/11 A	920 W/16.88 A
Fans	1	1	1	1

In addition to the primary and backup power supplies, the OmniSwitch 6860 family supports the OmniSwitch Backup Power Shelf (BPS). With flexible configuration and advanced management capabilities, the BPS is a powerful and cost-effective way to protect against primary power supply failure while reducing the closet space used. The OmniSwitch BPS supplies redundant power for system power as well as PoE. It can fully back up as many as eight attached OmniSwitch 6860 switches while load-sharing with the primary power supply.

PRODUCT SPECIFICATIONS AND MEASUREMENTS

Per-port LEDs
- Non-PoE ports - green: link/activity
- PoE ports - amber: link/activity

System LEDs
- OK1: green/yellow operational status of the switch
- OK2: green/yellow operational status of the external CPU
- VC: green/yellow master or slave role in VC configuration
- PS: green/yellow combined status for the primary and/or backup power supplies
- BPS: green/yellow status of the power coming from the Backup Power Shelf
- GRN: power saving mode
- 7-segment LED display for Virtual Chassis ID

Scalability numbers and speeds
- 24 and 48 ports: 10/100/1000, 28 ports: 100/1000Base-X with 4 x 10G SFP+ uplinks
- Wire rate at layer 2 and layer 3 on all ports
- Virtual Fabric Link (VFL) ports raw capacity: 42 Gb/s or 84 Gb/s aggregate
- Jumbo frame size: 9 216 bytes (for 1/10 Gb/s)
- Total number of MAC addresses: 48,000
- Total number of IPv4 routes: 64,000
- Number of VLANs: 4,000

COMPLIANCE AND CERTIFICATIONS

Commercial EMI/EMC
- FCC CRF Title 47 Subpart B (Class A)
- VCCI (Class A)
- AS/NZS 3548 (Class A)
- CE marking for European countries (Class A)
- EN 55022 (EMI & EMC)
- EN 61000-3-2
- EN 61000-3-3
- EN 55024 (Immunity)
  - ¬ EN 61000-4-2
  - ¬ EN 61000-4-3
  - ¬ EN 61000-4-4
  - ¬ EN 61000-4-5
  - ¬ EN 61000-4-6
  - ¬ EN 61000-4-8
  - ¬ EN 61000-4-11
- IEEE 802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)

Safety agency certifications
- US UL 60950-1
- IEC 60950-1 Health and Safety
- CAN/CSA-C22.2 No. 60950-1-03
- NOM-019 SCFI, Mexico
- AS/NZ TS-001 and 60950:2000, Australia
- UL-AR, Argentina
- UL-GS Mark, Germany
- CU, EAC, Russia
- EN 60825-1 Laser
- EN 60825-2 Laser
- CDRH Laser
- IEC 60950-1/EN 60950 with all country deviations
- IEC 60950-1:2005, Second Edition
- CCC, China*
- ANATEL, Brazil*
- BSMI, Taiwan*
- KCC, Korea*
  *Contact for availability

The OmniSwitch 6860 family is compliant with Restriction on Hazardous Substances (RoHS) and Waste Electrical and Electronic Equipment (WEEE) directives.

DETAILED PRODUCT FEATURES

Simplified manageability and configuration
- Intuitive Alcatel-Lucent CLI in a scriptable BASH environment via console, Telnet or Secure Shell (SSH) v2 over IPv4/IPv6
- Powerful Alcatel-Lucent WebView Graphical Web Interface via HTTP and HTTPS over IPv4/IPv6*
- Fully programmable RESTful web services interface with XML and JSON support. API enables access to CLI and individual mib objects
- Integrated with Alcatel-Lucent OmniVista™ products for network management
- Full configuration and reporting using SNMPv1/2/3 to facilitate third-party network management over IPv4/IPv6
- File upload using USB, TFTP, FTP, SFTP or SCP using IPv4/IPv6
- Human-readable ASCII-based configuration files for off-line editing, bulk configuration and out-of-the-box auto-provisioning
- Fully programmable OpenFlow 1.3.1 and 1.0 agent for control of native OpenFlow and hybrid ports *
- Multiple microcode image support with fallback recovery
- Dynamic Host Configuration Protocol (DHCP) relay for IPv4/IPv6
- IEEE 802.1AB Link Layer Discover Protocol (LLDP) with Media Endpoint Discover (MED) extensions
- Network Time Protocol (NTP)
- DHCPv4 and DHCPv6 server managed by Alcatel-Lucent VitalQIP™ DNS/DHCP IP Address Management
- Access to the AOS console via Bluetooth provides wireless management access to the OS6860, eliminating the use of console cables
  *Early availability support

Monitoring and troubleshooting
- Local (on the flash) and remote server logging (Syslog): event and command logging
- IP tools: ping and trace route
- Dying Gasp support via SNMP and syslog messages
- Loopback IP address support for management per service
- Management virtual routing and forwarding (VRF) support
- Policy- and port-based mirroring
- Remote port mirroring
- sFlow v5 and Remote Monitoring (RMON)
- Unidirectional Link Detection (UDLD), Digital Diagnostic Monitoring (DDM), and Time Domain Reflectometry (TDR)

Resiliency and high availability
- Unified management, control and virtual chassis technology
- Virtual Chassis 1+N redundant supervisor manager
- Virtual Chassis In-Service Software Upgrade (ISSU)
- Smart continuous switching technology
- ITU-T G.8032/Y1344 2010: Ethernet Ring Protection
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- Per-VLAN spanning tree (PVST+) and Alcatel-Lucent 1x1 STP mode
- IEEE 802.3ad/802.1AX Link Aggregation Control Protocol (LACP) and static LAG groups across modules
- Virtual Router Redundancy Protocol (VRRP) with tracking capabilities
- IEEE protocol auto-discovery
- Bidirectional Forwarding Detection (BFD) for fast failure detection and reduced re-convergence times in a routed environment
- Redundant and hot-swappable power supplies

- Built-in CPU protection against malicious attacks
- Split Virtual Chassis protection: Auto-detection and recovery of Virtual Chassis splitting due to one or more VFL or stack element failures

Advanced security
Access control
- AOS Access Guardian framework for comprehensive user-policy-based NAC
- Autosensing IEEE 802.1X multi-client, multi-VLAN support
- MAC-based authentication for non-IEEE 802.1X hosts
- Web based authentication (captive portal): a customizable web portal residing on the switch
- User Network Profile (UNP) simplifies NAC by dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW
- Secure Shell (SSH) with public key infrastructure (PKI) support
- Terminal Access Controller Access-Control System Plus (TACACS+) client
- Centralized Remote Access Dial-In User Service (RADIUS) and Lightweight Directory Access Protocol (LDAP) administrator authentication
- Centralized RADIUS for device authentication and network access control authorization
- Learned Port Security (LPS) or MAC address lockdown
- Access Control Lists (ACLs); flow-based filtering in hardware (Layer 1 to Layer 4)
- DHCP Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection
- ARP poisoning detection
- IP Source Filtering as a protective and effective mechanism against ARP attacks
- Bring Your Own Device (BYOD) provides on-boarding of Guest, IT/non-IT issued and silent devices. Restriction/Remediation of traffic from non-compliant devices. Uses RADIUS CoA to dynamically enforce User Network Profiles based on Authentication, Profiling, Posture check of devices.*
  * with Aruba ClearPass

QoS
- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS
- Flow-based traffic policing and bandwidth management
- 32-bit IPv4/128-bit IPv6 non-contiguous mask classification

- Egress traffic shaping
- DiffServ architecture
- Congestion avoidance: Support for end-to-end head-of-line (E2E-HOL) blocking prevention, IEEE 802.1Qbb Priority-based Flow Control (PFC) and IEEE 802.3x Flow Control (FC)

Layer-3 routing and multicast
IPv4 routing
- Multiple VRF
- Static routing
- Routing Information Protocol (RIP) v1 and v2
- Open Shortest Path First (OSPF) v2 with Graceful Restart
- Intermediate System to Intermediate System (IS-IS) with Graceful Restart
- Border Gateway Protocol (BGP) v4 with Graceful Restart
- Generic Routing Encapsulation (GRE) and IP/IP tunneling*
- Virtual Router Redundancy Protocol (VRRPv2)
- DHCP relay (including generic UDP relay)
- Address Resolution Protocol (ARP)
- Policy-based routing and server load balancing
- DHCPv4 server*
  *Early availability support

IPv6 routing
- Multiple VRF
- Internet Control Message Protocol version 6 (ICMPv6)
- Static routing
- Routing Information Protocol Next Generation (RIPng)
- Open Shortest Path First (OSPF) v3 with Graceful Restart
- Intermediate System to Intermediate System (IS-IS) with Graceful Restart
- Multi-Topology IS-IS*
- BGP v4 multiprotocol extensions for IPv6 routing (MP-BGP)
- Graceful Restart extensions for OSPF and BGP
- Virtual Router Redundancy Protocol version 3 (VRRPv3)
- Neighbor Discovery Protocol (NDP)
- Policy-based routing and server load balancing
- DHCPv6 server*
  *Early availability support

IPv4/IPv6 multicast
- Internet Group Management Protocol (IGMP) v1/v2/v3 snooping
- Protocol Independent Multicast

– Sparse-Mode (PIM-SM), Source Specific Multicast (PIM-SSM)
- Protocol Independent Multicast – Dense-Mode (PIM-DM), Bidirectional Protocol Independent Multicast (PIM-BiDir)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Multicast Listener Discovery (MLD) v1/v2 snooping
- PIM to DVMRP gateway support

Fluent network for voice, video and data
- Session Initiation Protocol (SIP) detection, session monitoring and tracking
- Provides real-time conversation quality information contained in the SIP packets concerning packet loss, delay, jitter, MOS score, R-Factor in real time
- SIP profile for QOS, priority tuning for end-to-end processing
- Multicast DNS Relay: Bonjour protocol support for wired Airgroup™

Advanced Layer-2 services
- Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)
- Fabric virtualization services IEEE 802.1aq Shortest Path Bridging (SPB-M)
- Ethernet network-to-network interface (NNI) and user network interface (UNI)
- Service Access Point (SAP) profile identification
- Service VLAN (SVLAN) and Customer VLAN (CVLAN) support
- VLAN translation and mapping including CVLAN to SVLAN
- Port mapping
- DHCP Option 82: Configurable relay agent information
- Multicast VLAN Registration Protocol (MVRP)
- HA-VLAN for Layer 2 clusters such as MS-NLB and active-active Firewall clusters
- Jumbo frame support
- Bridge Protocol Data Unit (BPDU) blocking
- STP Root Guard

SUPPORTED STANDARDS
IEEE standards
- IEEE 802.1D STP
- IEEE 802.1p CoS
- IEEE 802.1Q VLANs
- IEEE 802.1ad Provider Bridges Q-in-Q/VLAN stacking
- IEEE 802.1ak (Multiple VLAN Registration Protocol (MVRP)

- IEEE 802.1aq Shortest Path Bridging (SPB)
- IEEE 802.1s MSTP
- IEEE 802.1w RSTP
- IEEE 802.3x Flow Control
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ab 1000Base-T
- IEEE 802.3ac VLAN Tagging
- IEEE 802.3ad/802.1AX Link Aggregation
- IEEE 802.3ae 10 GigE
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at PoE Plus
- IEEE 802.3az Energy Efficient Ethernet (EEE)

ITU-T recommendations
- ITU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPv2)

IETF RFCs

IPv4
- RFC 2003 IP/IP Tunneling
- RFC 2131 Dynamic Host Configuration Protocol (DHCPv4)
- RFC 2784 GRE Tunneling

OSPF
- RFC 1765 OSPF Database Overflow
- RFC 1850/2328 OSPF v2 and MIB
- RFC 2154 OSPF MD5 Signature
- RFC 2370/3630 OSPF Opaque LSA
- RFC 2740/ 5340 OSPFv3 for IPv6
- RFC 3101 OSPF NSSA Option
- RFC 3623 OSPF Graceful Restart

RIP
- RFC 1058 RIP v1
- RFC 1722/1723/2453/1724 RIP v2 and MIB
- RFC 1812/2644 IPv4 Router Requirements
- RFC 2080 RIPng for IPv6

BGP
- RFC 1269/1657/4273 BGP v3 and v4 MIB
- RFC 1403/1745 BGP/OSPF Interaction
- RFC 1771-1774/2842/2918/3392/4271 BGP v4
- RFC 1965 BGP AS Confederations
- RFC 1966 BGP Route Reflection
- RFC 1997/1998/4360 BGP Communities Attribute
- RFC 2042/5396 BGP New Attribute

- RFC 2385 BGP MD5 Signature
- RFC 2439 BGP Route Flap Damping
- RFC 2545 BGP-4 Multiprotocol Extensions for IPv6 Routing
- RFC 2858/4760 Multiprotocol Extensions for BGP-4
- RFC 3065 BGP AS Confederations
- RFC 4456 BGP Route Reflection
- RFC 4486 Subcodes for BGP Cease Notification
- RFC 4724 Graceful Restart for BGP
- RFC 5492/5668/6793 BGP 4-Octet ASN

IS-IS
- RFC 1142/1195/3719/3787/5308 IS-IS v4
- RFC 2763/2966/3567/3373 Adjacencies and route management
- RFC 5120 M-ISIS: Multi Topology IS-IS
- RFC 5306 Graceful Restart
- RFC 5309/draft-ietf-isis-igp-p2p-over-lan Point to point over LAN
- RFC 6329 IS-IS Extensions Supporting IEEE 802.1aq SPB

IP Multicast
- RFC 1075/draft-ietf-idmr-dvmrp-v3-11.txt DVMRP
- RFC 2365 Multicast
- RFC 2710/3019/3810/MLD v2 for IPv6
- RFC 2715 PIM and DVMRP interoperability
- RFC 2933 IGMP MIB
- RFC 3376 IGMPv3 (includes IGMP v2/v1)
- RFC 3569 Source-Specific Multicast (SSM)
- RFC 3973 Protocol Independent Multicast-Dense Mode (PIM-DM)
- RFC 4087 IP Tunnel MIB
- RFC 4541 Considerations for IGMP and MLD Snooping Switches
- RFC 4601/5059 PIM-SM
- RFC 5015 BiDIR PIM
- RFC 5060 Protocol Independent Multicast MIB
- RFC 5132 Multicast Routing MIB
- RFC 5240 PIM Bootstrap Router MIB

IPv6
- RFC 1981 Path MTU Discovery
- RFC 2460 IPv6 Specification
- RFC 2461 NDP
- RFC 2464 IPv6 over Ethernet
- RFC 2465 MIB for IPv6: Textual Conventions (TC) and General Group
- RFC 2466 MIB for IPv6: ICMPv6 Group
- RFC 2711 Router Alert Option

- RFC 3056 6to4 Tunnels
- RFC 3315 Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 3484 Default Address Selection
- RFC 3493/2553 Basic Socket API
- RFC 3542/2292 Advanced Sockets API
- RFC 3587/2374 Global Unicast Address Format
- RFC 3595 TC for IPv6 Flow Label
- RFC 3596/1886 DNS for IPv6
- RFC 4007 Scoped Address
- RFC 4022/2452 MIB for IPv6 TCP
- RFC 4113/2454 MIB for IPv6 UDP
- RFC 4193 Unique Local Addresses
- RFC 4213/2893 Transition Mechanisms
- RFC 4291/3513/2373 Addressing Architecture (uni/any/multicast)
- RFC 4301/2401 Security Architecture
- RFC 4302/2402 IP Authentication Header
- RFC 4303/2406 IP Encapsulating Security Payload (ESP)
- RFC 4308 Cryptographic Suites for IPSec
- RFC 4443/2463 ICMPv6
- RFC 4861/2461 Neighbor Discovery
- RFC 4862/2462 Stateless Address Autoconfiguration
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6

Manageability
- RFC 854/855 Telnet and Telnet options
- RFC 959/2640 FTP
- RFC 1350 TFTP Protocol
- RFC 1155/2578-2580 SMI v1 and SMI v2
- RFC 1157/2271 SNMP
- RFC 1212/2737 MIB and MIB-II
- RFC 1213/2011-2013 SNMP v2 MIB
- RFC 1215 Convention for SNMP Traps
- RFC 1573/2233/2863 Private Interface MIB
- RFC 1643/2665 Ethernet MIB
- RFC 1867 Form-based File Upload in HTML
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2131 DHCP Server/Client
- RFC 2388 Returning Values from Forms: multipart/form-data
- RFC 2396 Uniform Resource Identifiers (URI): Generic Syntax
- RFC 2570-2576/3411-3415 SNMP v3
- RFC 2616 /2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB

- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 3023 XML Media Types
- RFC 3414 User-based Security Model
- RFC 4122 A Universally Unique IDentifier (UUID) URN Namespace
- RFC 4234 Augmented BNF for Syntax Specifications: ABNF
- RFC 4251 Secure Shell Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4627 JavaScript Object Notation (JSON)
- RFC 6585 Additional HTTP Status Codes

Security
- RFC 1321 MD5
- RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and crypto algorithms
- RFC 2104 HMAC Message Authentication
- RFC 2138/2865/2868/3575 /2618 RADIUS Authentication and Client MIB

- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 FTP Security Extensions
- RFC 2284 PPP EAP
- RFC 2869/2869bis RADIUS Extension
- RFC 4301 Security Architecture for IP

QoS
- RFC 896 Congestion Control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246 DiffServ
- RFC 2697 srTCM
- RFC 2698 trTCM
- RFC 3635 Pause Control

Others
- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP
- RFC 768 UDP
- RFC 793/1156 TCP/IP and MIB

- RFC 826 ARP
- RFC 919/922 Broadcasting Internet Datagram
- RFC 925/1027 Multi-LAN ARP/Proxy ARP
- RFC 950 Subnetting
- RFC 951 BOOTP
- RFC 1151 RDP
- RFC 1191 Path MTU Discovery
- RFC 1256 ICMP Router Discovery
- RFC 1305/2030 NTP v3 and Simple NTP
- RFC 1493 Bridge MIB
- RFC 1518/1519 CIDR
- RFC 1541/1542/2131/3396/3442 DHCP
- RFC 1757/2819 RMON and MIB
- RFC 2131/3046 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 2338/3768/2787 VRRP and MIB
- RFC 3021 Using 31-bit Prefixes
- RFC 3060 Policy Core
- RFC 3176 sFlow

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
OMNISWITCH 6860 BASIC MODELS	
OS6860-24-xx	OS6860-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter
OS6860-24D	OS6860-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter
OS6860-P24-xx	OS6860-P24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 10/100/1000 Base-T PoE ports, four fixed SFP+ (1G/10G) ports and two 20G VFL/stacking ports. The bundle includes a mid-power AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a USB-to-USB console adapter.
OS6860-48-xx	OS6860-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, 4 fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one AC power supply, country specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB to USB console adapter.
OS6860-48D	OS6860-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860-P48-xx	OS6860-P48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T PoE+ ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one 920-W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.

OMNISWITCH 6860 ENHANCED MODELS	
OS6860E-24-xx	OS6860-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-24D	OS6860-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two 20G VFL/stacking ports. The bundle includes one AC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-P24-xx	OS6860E-P24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T PoE+ ports, four of them provide 60 W, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one 600-W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-48-xx	OS6860E-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-48D	OS6860E-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-P48-xx	OS6860E-P48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T PoE+ ports, four of them provide 60 W, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one 920-W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-U28-xx	OS6860E-U28: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 28 100/1000 Base-X SFP ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OS6860E-U28D	OS6860E-U28: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 28 100/1000 Base-X SFP ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two 20G VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter.
OMNISWITCH 6860 POWER SUPPLIES	
OS6860-BP-D	OS6860-BP modular 150-W DC backup power supply. Provides backup power to one non-PoE OS6860 or OS6860E switch
OS6860-BP-xx	OS6860-BP modular 150-W AC backup power supply. Provides backup power to one non-PoE OS6860 or OS6860E switch
OS6860-BPPH-xx	OS6860-BP-PH modular 600-W AC PoE backup power supply. Provides system and PoE backup power to one 24-port PoE OS6860 or OS6860E switch
OS6860-BPPX-xx	OS6860-BP-PX modular 920-W AC PoE backup power supply. Provides system and PoE backup power to one 48-port PoE OS6860 or OS6860E switch
OMNISWITCH 6860 SOFTWARE	
OS6860-SW-AR	OS6860-SW-AR: Advanced routing software license. Includes support for VRF, IPv4 routing protocols BGP, OSPFv2, PIMSM/DM, DVMRP. Includes IPv6 Routing, RIPng, OSPFv3, as well as SPB-M
OMNISWITCH 6860 ACCESSORIES	
OS6860-CBL-40	OS6860 20 Gigabit direct attached copper cable (40 cm, QSFP+) for Virtual Chassis connections
OS6860-CBL-100	OS6860 20 Gigabit direct attached copper cable (1m, QSFP+) for Virtual Chassis connections
OS6860-CBL-300	OS6860 20 Gigabit direct attached copper cable (3m, QSFP+) for Virtual Chassis connections
GIGE TRANSCEIVERS	
SFP-GIG-T	1000Base-T Gigabit Ethernet Transceiver (SFP MSA). SFP works at 1000 Mb/s speed and full-duplex mode
SFP-GIG-SX	1000Base-SX Gigabit Ethernet optical transceiver (SFP MSA)
SFP-GIG-LX	1000Base-LX Gigabit Ethernet optical transceiver (SFP MSA)
SFP-GIG-LH40	1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 40 km on 9/125 μm SMF
SFP-GIG-LH70	1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 70 km on 9/125 μm SMF

10G TRANSCEIVERS	
SFP-10G-SR	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 850 nm wavelength (nominal) with an LC connector. Typical reach of 300 m
SFP-10G-LR	10 Gigabit optical transceiver (SFP+). Supports monomode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 km
SFP-10G-ER	10 Gigabit optical transceiver (SFP+). Supports monomode fiber over 1550 nm wavelength (nominal) with an LC connector. Typical reach of 40 km
SFP-10G-LRM	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 220 m on FDDI-grade (62.5 µm)
SFP-10G-GIG-SR	Dual-speed SFP+ optical transceiver. Supports multimode fiber over 850 nm wavelength (nominal) with an LC connector. Supports 1000Base-SX and 10GBase-SR
SFP+ DIRECT ATTACHED CABLES	
SFP-10G-C1M	10 Gigabit direct attached copper cable (1 m, SFP+)
SFP-10G-C3M	10 Gigabit direct attached copper cable (3 m, SFP+)
SFP-10G-C7M	10 Gigabit direct attached copper cable (7 m, SFP+)

Please replace the "-xx" in the part number with the country-specific power cord (e.g. OS6860-24-US will come with a power cord for the USA, -UK for United Kingdom). We offer 11 different power cord options. Please consult with the price list for the official power cord options offered.

WARRANTY

The OmniSwitch 6860 family comes with a Limited Lifetime Warranty.

SERVICES AND SUPPORT

For more information about our Professional services, Support services, and Managed services, please go to http://enterprise.alcatel-lucent.com/?services=EnterpriseServices&page=directory.

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